BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Extended Diploma in Health and Social Care (Health Studies)
Unit number and title	**Unit 19 : Medical Physics Applications in the Health Sector**
Learning aims	Learning aim A: Understand how non-ionising radiation instrumentation techniques are used for diagnosis and treatment of the human body Learning aim B: Understand how ionising radiation instrumentation techniques are used for diagnosis and treatment of the human body Learning aim C: Explore the risks, side effects and health and safety precautions for ionising and non-ionising radiation.
Assignment title	**Using physics in medicine**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are preparing to apply to a degree course with the intention of training to become a radiographer in a general hospital. As part of your preparation, you have been to the local hospital, seen the radiographers and found what you saw interesting. However, you are not really sure what it is they actually do and have decided to carry out further investigations into what the role actually entails. You are hoping to explore the science behind the application of physics to medicine.

Task 1	Your first report is an evaluation of the choice of ionising and non-ionising radiation diagnosis and treatment techniques in relation to a specific service user. The Service user can be based on a case study you have been provided with, or a case study of your own. If you use your own, remember to follow the rules about confidentiality, at all times. Your evaluative report must also cover the following: • an assessment of the suitability of different non-ionising radiation diagnosis and treatment techniques in relation to a specific service user • an analysis of the suitability of different ionising radiation techniques used for diagnosis and treatment in relation to a specific service user. Your report must explain: • the principles and production of a laser and how it is used in diagnosis and treatment • the principles and production of imaging techniques used in non-ionising radiation diagnosis in relation to a specific service user • the principles and production of external and internal radiotherapy • the principles and production of x-ray images, CT and CAT scans for diagnosis and treatment in relation to a specific service user. Finally, your report should include scientific posters, diagrams flow charts, tables and mind maps where you think they are relevant to the information you are evaluating.
Checklist of evidence required	A report based on a case study evaluating correct ionising and non-ionising treatment options with scientific posters, diagrams, flow charts, tables and mind maps.

Criteria covered by this task:	
Criteria reference	To achieve the criteria, you must show that you are able to:
AB.D1	Evaluate the choice of ionising and non-ionising radiation diagnosis and treatment techniques in relation to a specific service user.
A.M1	Assess the suitability of different non-ionising radiation diagnosis and treatment techniques in relation to a specific service user.
B.M2	Analyse the suitability of different ionising radiation techniques used for diagnosis and treatment in relation to a specific service user.
A.P1	Explain the principles and production of a laser and how it is used in diagnosis and treatment.
A.P2	Explain the principles and production of imaging techniques used in non-ionising radiation diagnosis in relation to a specific service user.
B.P3	Explain the principles and production of external and internal radiotherapy.
B.P4	Explain the principles and production of x-ray images, CT and CAT scans for diagnosis and treatment in relation to a specific service user.
Task 2	Your second report should evaluate the health and safety precautions for service users and operators using ionising and non-ionising diagnosis and treatment techniques in relation to a specific service user and justify a choice of ionising and non-ionising diagnosis technique with reference to risks, side-effects and safety precautions for a service user in relation to a specific service user. You should include x-ray and MRI use in your evaluation. As part of your evaluation, you must ensure you analyse and explain the risks and side-effects to operators and service users and you include an explanation of the safety precautions for x-ray and MRI use for operators and service users
Checklist of evidence required	A report on the risks, side effects and health and safety rules for service users and operators relating to ionising and non-ionising radiation, with tables, scientific posters and images.

Criteria covered by this task:	
Criteria reference	To achieve the criteria, you must show that you are able to:
C.D2	Evaluate the health and safety precautions for service users and operators using ionising and non-ionising diagnosis and treatment techniques in relation to a specific service user.
C.D3	Justify a choice of ionising and non-ionising diagnosis technique with reference to risks, side-effects and safety precautions for a service user in relation to a specific service user.
C.M3	Analyse the risks and side-effects to operators and service users of ionising and non-ionising diagnosis and treatment techniques in relation to a specific service user.
C.P5	Explain the risks and side effects of ionising and non-ionising diagnosis and treatment techniques for operators and service users.
C.P6	Explain the safety precautions for x-ray and MRI use for operators and service users

Sources of information to support you with this Assignment	**Books** Keevil et. Al — *Introduction to Medical Physics* (CRC Press, 2022) ISBN 9781138742833 Pope J — *Medical Physics Imaging* (Heinnemann, 1999) ISBN 9780435570941 **Websites** https://humanhealth.iaea.org/hhw/medicalphysics/index.html https://www.superprof.co.uk/resources/questions/physics/why-physics-is-important-in-medicine.html
Other assessment materials attached to this Assignment Brief	N/A